

**What is claimed is:**

- 1           1.       A verification test bench system used in testing in a core which is used in a  
2 design which comprises:
  - 3           a.       a bus functional model which comprises a mirror interface to the core and  
4  
5               memory;
  - 6           b.       a bi-directional general purpose I/O device; and
  - 7           c.       a control mechanism which comprises:
    - 8               1)     a standardized handshake protocol between the design and the  
9                      mirror interface; and
    - 10              2)     control code loaded into the bus functional model that controls data  
11                      flow, transfer direction, and data checking when a test case is  
12                      running in the design.
- 1           2.       The verification test bench system of claim 1, wherein said core has an  
2 interface external to said design, said mirror interface is coupled to said external interface,  
3 and said test case issues directives in said handshake protocol to initiate and control an  
4 exchange of data between said mirror interface and external interface.
- 1           3.       The verification test bench system of claim 2, wherein said bi-directional  
2 general purpose I/O device is coupled between said design and said bus functional model,  
3 and transfers said directives between said design and said bus functional model.
- 1           4.       The verification test bench system of claim 2, wherein said control code  
2 responds to said directives by configuring said mirror interface for said exchange of data.
- 1           5.       The verification test bench system of claim 4, wherein said control code  
2 verifies results of said exchange of data.

1           6.     A verification system comprising:  
2                 a core in a system-on-chip (SOC) design, said core having an interface  
3 external to said SOC;  
4                 a copy of said core comprising a mirror interface, said mirror interface  
5 coupled to said external interface of said core;  
6                 a control mechanism for controlling said mirror interface; and  
7                 a test case executing in said SOC which applies verification stimuli to said  
8 external interface using said control mechanism.

1           7.     The verification system of claim 6, said control mechanism comprising:  
2                 a standardized handshake protocol for communicating with said SOC; and  
3                 control code for configuring said mirror interface and transferring data to said  
4 external interface via said mirror interface.

1           8.     The verification system of claim 7, further comprising communication  
2 means coupled between said SOC and said control mechanism for transferring control  
3 directives in said handshake protocol from said test case to said control mechanism.

1           9.     The verification system of claim 8, wherein said test case issues directives  
2 for initiating a data transfer between said mirror interface and said external interface.

1           10.    The verification system of claim 9, wherein said control mechanism  
2 configures said mirror interface in response to said directives.

1           11.    A verification method comprising:  
2                 attaching a mirror interface to an external interface of a core in an SOC; and  
3                 executing a test case in said SOC which applies test stimuli to said external  
4 interface using said mirror interface.

1           12.    The method of claim 11, further comprising providing a control

2 mechanism for enabling said test case to configure and control said mirror interface.

1 13. The method of claim 12, wherein said control mechanism comprises:  
2 a standardized handshake protocol for communicating with said SOC; and  
3 control code for configuring said mirror interface and transferring data to said  
4 external interface via said mirror interface.

1 14. The method of claim 13, further comprising issuing directives in said  
2 handshake protocol to said control code, to configure said mirror interface and initiate  
3 data transfer between said mirror interface and said external interface.

1 15. The method of claim 11, further comprising connecting a bus functional  
2 model to said mirror interface, to provide processor bus cycles for driving said mirror  
3 interface.

1 16. The method of claim 12, further comprising connecting bi-directional  
2 communication means between said SOC and said control mechanism, to enable said test  
3 case to communicate with said control mechanism.

1 17. A program product tangibly embodied on a computer-usable medium, said  
2 program product comprising computer-executable instructions which when executed  
3 implement a process comprising the steps of:  
4 connecting an external interface of a core on an SOC to a mirror interface of said  
5 external interface; and  
6 executing a test case in said SOC to apply test stimuli for verification of said  
7 external interface via said mirror interface.

1 18. The program product of claim 17, said process further comprising  
2 executing a control mechanism for enabling said test case to control said mirror interface.

1           19.     The program product of claim 18, said step of executing a control  
2 mechanism comprising:  
3           receiving directives issued by said test case in a handshake protocol; and  
4           configuring said mirror interface for an exchange of data with said external  
5 interface in response to said directives.

1           20.     The program product of claim 17, said process further comprising  
2 implementing communication means for enabling said test case to communicate with said  
3 mirror interface.

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